

REMARKS

The abstract, and pages 3-4 of the specification, have been amended in response to paragraphs 4 and 5 of the office action. The new language inserted in both of these places is taken from page 11, lines 8-15 of the specification.

Page 7 of the application has been amended to improve the grammar of a sentence, in response to the objection stated in paragraph 5.b. of the office action.

Claim 1 has been amended by removing the word “type” from line 6 of the claim, by correcting “ink absorbing” to “glossy” in line 10, and by replacing “maintain their particulate shapes” with more specific language taken from page 11 lines 8-15 of the specification.

Claim 2 has been amended to remove the word “type” from line 2 of the claim.

Claims 7 and 8 have been amended to remove the word “type”, and to insert “said base material or” into line 5 of each of the claims. Support for said base material appears in line 2 of the original claims.

Regarding the objections to the specification

The amendments to the specification are believed to resolve the objections raised by the examiner in paragraphs 4 and 5 of the office action.

Regarding the §112 rejections

These rejections are believed to be overcome by the various amendments to the claims.

Regarding the §103(a) rejections

The §103(a) rejections are respectfully traversed for the following reasons. The following discussion centers around the “glossy” layer specified in applicant’s claims, versus the “porous top layer” of the primary reference (Hamada, US 6,177,181). The examiner’s position is that Hamada’s “porous top layer” is “identical to” the applicant’s glossy layer. Applicants’ respectfully disagree with the examiner’s position on that point.

Applicant’s glossy layer, as defined in amended claim 1, has the following characteristics:

1. It is a dispersion of fine, non-crosslinked styrene-acrylic polymer particles.
2. The particles are obtained by a copolymerization reaction of monomer components containing at least a cationic monomer, (meth)acrylamide, styrene and methyl methacrylate.
3. The glossy layer is formed such that the boundary area between the particle polymers is not lost due to fusion of adjacent polymer particles, and small voids are left in the boundary between particles.

Applicants' maintain the Hamada's porous top layer meets none of these criteria.

In Hamada's process, the porous top layer is formed by first dissolving a polymer in a mixture of solvents, one being a good solvent for the polymer and the other being a higher boiling, poor solvent for the polymer. The solution is formed into a film, and subjected to a drying process. At column 11 lines 13-22, Hamada describes the events that occur during the drying process in this way (emphasis added):

In the drying step for drying the dope thus applied, the good solvent having a lower boiling point evaporates preferentially. With the progress of this good solvent evaporation, the solubility of the polymer in the dope decreases, and the polymer forms micelles (gel phase), resulting in phase separation from the poor solvent phase. With the further progress of drying, micelles contact with one another to form a network structure. Upon completion of the poor solvent evaporation, a porous membrane or porous film is formed.

So, in Hamada's process, fine polymer particles are not formed. Instead, a polymer solution is formed in Hamada's process and the polymer is converted during the first stage of Hamada's drying process to form micelles. Hamada explicitly describes the micelles as being a "gel phase", rather than as simply "polymer particles". The description of these micelles as being a gel phase plainly indicates that the micelles are are solvent-laden. The fact that these micelles form a network structure upon further drying indicates that the micelle "gel phase" is in the form of liquid droplets rather than in the form of particles, as required in applicant's claims.

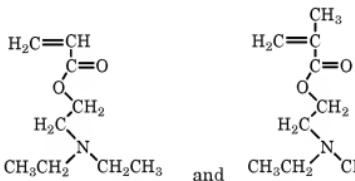
Hamada's top porous layer clearly is not in the form of particles once the network has been formed. Hamada provides micrographs of his films. In each case, the polymer phase takes the form of interconnected masses of materials with no clear boundaries between its constituent masses, and without voids being left at the boundaries between individual masses. The morphology of Hamada's films is consistent with his description of the film-forming process at page 11, and is typical of a polymer structure that is formed by

precipitating a polymer from solution in the presence of a porogen (which is the function of Hamada's "poor" solvent). The examiner is invited to compare Hamada's micrographs with Figure 1 of applicant's application. In applicant's figure 1, the clear particulate structure of applicant's glossy layer is shown. That structure is in clear contrast with the networked agglomeration of polymeric masses pictured in Hamada's figures.

Therefore, Hamada's films clearly do not meet criterion (3) of applicants' claim 1.

The examiner regards Hamada's column 13 lines 26-58 as disclosing the specific copolymers identified in applicants' claim 1 (criterion (2) above). Applicant's disagree, for at least two reasons.

First, the examiner states that N,N-dimethylaminoethyl(methacrylate) is a cationic monomer. This is incorrect. These monomers have the structures



In each case, the nitrogen atom is tertiary, not quaternary, and the molecule is not cationic.

Second, the Hamada reference does not disclose or fairly suggest any copolymer of all four of a cationic monomer, (methacrylamide), styrene and methyl methacrylate. The passage the examiner points to (col. 13 lines 26-58) describes polymers of vinyl acetate. The vinyl acetate may be polymerized with one or more of a long list of possible comonomers. None of the comonomers is cationic. In the cited passage, Hamada mentions at least seven possible different classes of comonomers (olefins and dienes, maleic acid dialkyl esters, (meth)acrylate monomers, allyl-series monomers, sulfo- or sulfonate salt containing monomers, carboxyl- or carboxylate salt-containing monomers and vinyl-series monomers), of which all except two are irrelevant to applicant's disclosure. In that same passage, Hamada mentions at least 31 different compounds, and even this list does not include the additional species taught in the next two paragraphs of the Hamada reference (col. 13 line 59 through col. 14 line 16). If one is to selected combinations of two or more of these monomers, the range of possibilities become enormous. In this case, it would be necessary for the skilled artisan to selected one specific combination of three of these monomers ((meth)acrylamide, styrene, methyl methacrylate), from the large number of combinations

that are possible from Hamada's teachings. This combination must be made without any guidance at all from Hamada to select any particular combination of even two, much less three, monomers from his list. Then one must take this specific combination and add to it a cationic monomer that Hamada does not even describe.

There is simply no reasonable argument by which Hamada could be said to either describe applicants' copolymer or suggest them, without benefit of applicants's own disclosure.

For these reasons, Hamada's porous top layer is not the same as applicant's glossy layer, nor does it suggest such a layer. Hamada's top layer is different both structurally and chemically from applicants' glossy layer.

The other references, either singly or in combination with Hamada, fail describe or suggest a glossy layer as described in applicants' claim 1.

Therefore, applicants' claim 1 is not obvious over the combination of the cited references. The examiner is requested to withdraw this rejection as it pertains to claim 1 and claims that depend from claim 1.

As to claims 7 and 8, applicants first note that the specific copolymer defined in the claim is not disclosed or suggested by Hamada, and the rejection of those claims fails for at least that reason. Claim 7 also requires a calendaring step under a specific set of conditions, including a temperature of room temperature to 40°C. Hamada does not disclose such a calendaring step, and based on Hamada's disclosure, offers no reason to include one. Instead, the examiner relies on an "admission" on page 2, lines 13-27 that calendaring steps have been used in the prior art. This ignores the facts that (1) the specific calendaring conditions of claim 7 are not described at page 2, lines 13-27; (2) this "admission" also mentions that papers made using those calendaring processes do not perform adequately (see lines 18-19 and 26-27 especially), and exactly contrary to the examiner's assertion, and (3) the cited passage specifically states that the calendaring treatment needs to be conducted at a temperature approximating the glass transition temperature of the cationic organic particles (lines 24-26) in order to impart gloss.

Regarding the requirement for a new declaration

The requirement for a new declaration is noted. Applicants are attempting the relocate the inventors to obtain a newly executed declaration, and will submit it as soon as it becomes available.

Conclusion

The specification has been amended in response to the examiner's objections. Certain claims have been amended to put them into better form. The subject matter of the claims has been shown to be novel and unobvious over the cited references. Applicants believe the the case is now in condition for allowance, and a notice to that effect is requested.

Respectfully submitted,  
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